Refinement of the Relative Value Scale of Physicians' Work

by

J. Sanford Schwartz, MD: Principal Investigator
Orit Even-Shoshan, MA
Keith Aaronson, MD
Lily Moumtaz, MS

Federal Project Officer: Michael Borowitz, MD, Ph.D.

HCFA Research Center
Sponsored by the University of Minnesota,
the University of Pennsylvania, and
Mathematica Policy Research, Inc.

HCFA Cooperation Agreement No. 99-C-99169/5-03
May, 1993

The authors of this report are affiliated with the Leonard Davis Institute of Health Economics, University of Pennsylvania.

The total cost of this project was $100,000, 100% of which was financed by federal funds.

The statements contained in this report are solely those of the authors and do not necessarily reflect the views or policies of the Health Care Financing Administration. The contractor assumes responsibility for the accuracy and completeness of the information contained in the report.

Executive Summary

Introduction

The purpose of this study is to examine methods for refining the Relative Value Scale (RVS) for physicians' services. The study has two components: an assessment of the small group process for refining the RVS values for physicians' services, and an examination and evaluation of alternative methods for estimating and refining the RVS for physicians' work.

A draft report on the process and results of the second component, the cardiology panel, was submitted to the Health Care Financing Administration (HCFA) in October 1992. This report describes the organization of a meeting of representatives from different groups which have developed, refined or had an input in creating the RVS for physicians' services. During the one-day meeting, we evaluated different approaches for estimating and refining the work component of physicians' services and for identifying controversial issues requiring further research.

This report describes the study's first component, an evaluation of the process followed by the expert panel discussion that took place on July 15, 1992. It summarizes the different methods used to measure physicians' work described in position papers sent by participants, as well as HCFA's main concerns. This report also synthesizes the participants' views expressed in the discussion of the major advantages and disadvantages of each method. Finally, based on concerns raised by participants and on our assessment of the major areas of controversy, we identify areas for future exploration and develop an outline for a research agenda.

Background

On January 1, 1992, implementation of the Medicare Fee Schedule began. HCFA published the Final Rule on November 25, 1991, establishing the elements (work, practice expense, malpractice expense, relative value units (RVUs), an initial conversion factor (CF) of $30, and geographic adjustment factor (GAF)) for calculating physicians' payments. Relative work values have now been established for over 6,000 codes of physicians' services. Although much of the development work has been done, the resulting fee schedule requires significant refinement and the design phase is still continuing.

The design of the fee schedule has implications beyond the Medicare program, as some state Medicaid programs and some private payers intend to adopt elements of the fee schedule. The prospect of a broad use of the Medicare Fee Schedule increases the importance of ensuring accuracy and equity of the relative value scale as it will account for a greater proportion of physicians' incomes. In developing a fee schedule based on a resource based relative value scale (RBRVS), Hsiao and his research team intended to set CPT-4 code level prices as if they were developed in a competitive market place. The fee schedule developed, based on physicians' surveys, using order of magnitude estimation techniques, replaces the previous customary, prevailing and reasonable charge system which was flawed because of distortions in the insurance market. These distortions caused prices for procedural services to be too high relative to prices for evaluation and management (EM) services. Such price distortion resulted in an oversupply of procedural services relative to cognitive services.

In the short term, HCFA plans to refine the physicians' work fee schedule by inviting comments from the specialty societies. In the first round of refinements, comments were submitted in a pre-specified format, using "reference procedures" when discussing problems with the RVS or making a case that a specific value should be changed. HCFA staff analyzed the comments and the most relevant were passed on for further analysis in Carrier Medical Director group processes. The purpose of this project is to examine the refinement process by reviewing experts' concerns and opinions, and to suggest improvements to this process.

Conclusions

All participants in the experts' panel agreed that the refinement of the Relative Value Units of physicians' work should focus first on problems common to all specialties. The participants' opinions concerning the process of refinement seemed to be that a panel discussion followed by individual ratings of work values are preferable to an imposed consensus rate. The panel rates should be supported by data collected through mail surveys of physicians. All specialties' refinement panels should use the same methodology, the same format for submitting comments and the same type of data to support arguments.

Participants consider the current composition of panels suitable for refining physicians' work values. These panels consist of two representatives from the specialty that submitted the comments, four representatives from related specialties, two representatives from the American Medical Association, the American College of Physicians or other medical societies, and five Carrier Medical Directors. In the future, internists participating in the specialty refinement panels should receive more intensive preparation in the work performed by the physicians delivering the service.

All participants recognize the importance of identifying and collecting the information needed to refine and update physicians' work values, including the development of a system for monitoring new technologies. They recommend the development of a research agenda to improve the methodology of RBRVS, expand it to non-physician services, and create the necessary data bases.

Report on the Experts Meeting on July 15, 1992

Summary of Experts' Approaches to the Refinement Process

Since the publication of the Hsiao et al. study (Hsiao, 1988), many of the study's methodological issues have been questioned. Since the fee schedule has been already implemented, providers and policy makers feel that it is necessary to speed up the refinement of the original scale in order to achieve a reimbursement system that is equitable, acceptable to most physicians, and does not compromise access or quality of care.

The theoretical basis of RBRVS assumes that in the health care market, the information asymmetry between patient and physician combined with conflict between the physician-patient agent relationship and the physician's interest to increase his or her income, lead to market failure. RBRVS, mimicking a well-functioning competitive market, is supposed to set a reimbursement level equal to the marginal cost of providing services. The fees established should ensure budget neutrality in an equitable and efficient way. Critics of the method point out that economic theory does not support the assumption that RBRVS will necessarily increase the efficiency of resource allocation among physicians' services; the effect of the fee schedule on the efficiency of resource allocation will depend on the relation between the income effect and the substitution effect (Pauly, 1989). A technical observation on Hsiao's studies criticizes the use of the long run average cost instead of the long run marginal cost due to the difficulty of measuring marginal costs. Using long run average costs rules out the possibility of economies of scale in providing a service.

The Harvard Study

In measuring the resource-input costs of physicians' services, the Hsiao team observed the total work input by the physician. Total work includes the physician's work before, during and after the actual delivery of the service (pre and post time). Time is modified by:

- mental effort and judgment
- technical skill
- physical effort
- stress due to risk

Work was measured using the magnitude estimation method, in which respondents rate a service in relation to a reference procedure, using a ratio rather than a cardinal or ordinal scale. Vignettes of physicians' services, representing the delivery of a typical service described by the Current Procedural Terminology (CPT) were developed and mapped into CPT codes. To rate total work values of the services described in the vignettes, a national stratified random sample of 3200 physicians was surveyed using cross-specialty linkages, which are services performed by more than one specialty. Relative values of services which were not obtained directly from the survey were estimated through extrapolation.

Several aspects of the methodology used by the Harvard group were challenged by the participants in the discussion we held, and their comments suggest that further refinement of the method is necessary to increase the level of acceptance of the RBRVS by different groups representing physicians, researchers and policy makers. The following issues in the methodology were found most controversial:

- measurement of total work as opposed to separate measurement of the work components
- the use of phone and mail surveys instead of consensus panels
- the cross-specialty linkage and the related statistics
- the definitions of CPT codes are not clear enough and create ambiguity as to the service provided.

In addition, the reliability and validity of the Harvard study have been questioned since, in some instances, researchers using different methods for calculating relative values obtained different results.

HCFA's Perspective on the Medicare Fee Schedule Refinement Issues

At the July 15 meeting, HCFA raised several methodological questions concerning the refinement process, and emphasized that the focus is on refinement of the method and not on reinvention. The aspects of the refinement process raised can be categorized into two groups: process and structure of the refinement, and conceptual issues of defining the parameters of the scale.

The first aspect of the refinement process raised by HCFA concerned the process through which total work is assessed. HCFA questioned whether the information should be obtained through panel meetings or through surveys, and whether the survey instrument could be used selectively to validate or supplement the panel process. In addition to other drawbacks, the survey instrument used to develop the RVS for the first set of vignettes is more expensive than the small group process. This question was discussed extensively by the participants in the panel discussion.

HCFA wanted to determine how often the scale should be reviewed and updated, and whether the review should be limited to services most in need of revision or done at set intervals for certain sets of codes. In addition, HCFA is concerned about the appropriateness of rating by physicians from related specialties. Other HCFA concerns about the organizational structure of the refinement process include the possibility of bias in ratings produced by panels or surveys, due to participants' awareness of the payment implications of the RVUs, and the convergence resulting from the panel discussion.

HCFA questioned whether the participation of non-specialists on these panels ensures that unfounded claims are not accepted by the panel. Additional checks and balances are needed in the refinement process to minimize the effects of vested interests. The problem with consensus ratings, or with ratings resulting from a panel's discussion even when consensus is not required, is that they disproportionately reflect the opinion of the most outspoken participants. The other issue with consensus rating is that while they produce results which are viewed as reasonable and acceptable by participants, they do not allow identification of outlier values or of the span of values.

The conceptual issues raised by HCFA concern the development and validation of a reference set of procedures, linkage of specialty reference sets, and the definition of work by components or as total work. The development of a reference set requires the identification of criteria for inclusion of codes, a validation process of its values, and the establishment of a procedure for addressing reviewers' questions concerning the reference set values. The reference set could be developed within specialties or could span the entire range of physicians' services. If separate, within-specialty sets are developed, the question of across-specialty linkage while maintaining relativity of values needs to be addressed to form a larger set of references.

The work component of surgical services needs to be defined more clearly; some propose to limit it to the intra-operative work only, while others want to include pre- and post-operative work. The broader inclusion option will make the comparison with non-surgical codes more difficult.

The last concern raised by HCFA was over the type of information that is helpful to reviewers and whether statistical arguments explaining a service value are to be brought into a panel's discussion; if data or statistics are used, the panels should include statisticians and HCFA questions whether the data experts should be resource people only, or should participate in the rating.

Finally, a budget neutrality reallocation within specialties was suggested as an alternative to the process of refining RVUs. In this approach, the specialties would accept the total budget as derived from the existing RVS for physicians' work, and for any increase in the RVU of a service, the specialty would recommend a reduction in another RVU, so that Medicare's total expense for services provided by that specialty would not be affected.

Aspects of RBRVS That Require Reconsideration

Concerns and controversial issues in the refinement process were raised by the participants in the expert panel, LDI's research team, and HCFA representatives. The participants were asked to address these issues in writing prior to the meeting. Their position papers were distributed to all participants before the meeting to familiarize them with each others' views. The participants categorized the aspects of RBRVS requiring refinement into aspects to be addressed in the short to medium term and aspects to be dealt with in the long term.

The participants felt that the following issues need to be reconsidered promptly:

- Systematic review of the work values—all the work values should be carefully and systematically reviewed by physician panels, both within and across specialties.

- The development of more cross-specialty links for specialties that have fewer than eight links—the reliability of locating a particular specialty's services on the common scale and the validity of the location of the link on the scale may be adversely affected when the number of cross-specialty links is insufficient.

- Further research is needed on the quantitative approach to cross-specialty linkage that was used by the Harvard team.

- Reevaluation of cross-specialty linkage effects on certain insular specialties.
- A valid reference set of accepted work values that can be used to anchor future work component measurement; no rerating of reference procedures is suggested, but controversial codes should be removed.
- A clearer definition of an episode of care (e.g. peri- and intra-service work estimation, global fees, etc.)
- The development of relative values based on estimates of the resource inputs required to provide services to the typical patient rather than the typical Medicare patient. For many, but not all procedures, Medicare patients may require additional care. A modified value scale based on typical patients would be expected to yield different relative values than one based on the typical Medicare patient for at least some procedures.
- Services provided by non-physicians, such as assistants-at-surgery and physical therapists, are currently paid on other than a resource-based system. Relative values need to be developed based on the same methodology used for most practitioner services covered under the new fee schedule.
- A more systematic comparison of the contents of the global surgical services, which include the time period after the procedure is performed, and the relative work values for these services—much of the work done by the Harvard research team was completed before agreement had been reached on the appropriate global surgical service definition. Therefore, it does not appear that all of the care covered under the global fee was taken into account when the relative work values were determined.
- The compression effect in the Hsiao values for services at both ends of the scale needs further study, i.e., the determination within the service encounter of pre and post, skin to skin for procedures and face to face for EM services.

Review and Comparison of Methods to Assess Physicians' Work

Some participants in the panel meeting of July 15, conducted studies to assess physicians' work using a different methodology than the one used by the Harvard team. Others only suggested alternative methods, or indicated their dissatisfaction with the existing method by pointing out some of its distortions. The methods discussed by the participants included the following:

Cross-Specialty Linkage

- The phase II methodology (bi-weighting) drops links judged to be clinically valid. Specialties with few links can be strongly affected when a single link is dropped.

- Establishment of interdisciplinary links before review of the specialty scales. The development of an agreed-upon multidisciplinary reference set will prompt specialists to think beyond their own specialties. The establishment of such a reference set is thought to facilitate recommendations for work values in each specialty and for these recommendations to be reviewed by panels.

Use of Panels vs. Mail/Phone Surveys

- The panel assures representation of both experts and generalists. It is possible to review a large number of codes if the discussion is well-organized. Discussion of each question reveals possible confusion and facilitates common understanding of complex issues among participants. During a panel meeting, it is important to allocate sufficient time to the discussion of benchmark services to make sure that participants have the same understanding of their definition, and the work required.

- The panel also allows a discussion of the differences in opinions among participants. Consensus and the use of judgment is possible, though it may be considered by some to be a source of bias and the effect of individual persuasive styles. Immediate feedback and an iterative process are possible using computers. However, it is hard to assure broad representation given the limited number of individuals that can participate.

- The panel process is improved when multiple panels review the same codes.

- The cost of conducting national surveys is very high. In addition, the results yield high levels of individual differences which make the review process difficult. It was found that the ratings are not significantly altered by characteristics of practice and frequency of performance.

- The national survey method ensures high levels of reliability and validity and provides standard data. It also has the advantage of establishing the validity of data obtained by other means and is recommended for a limited set of procedures.

Presentation of Services to Be Rated

- Participants considered discussion of services as defined by CPT codes preferable to vignettes describing typical encounters. The discussion of the variety of patients seen and the frequency of each type may be more beneficial than the use of vignettes that are supposed to describe an average patient. The Harvard group used vignettes for EM services for which the CPT descriptors are general. For procedural services, CPT descriptors are specific and were used for the average patient.

- It is argued that methodological research has proven that there is no loss of precision when CPT descriptors are used instead of vignettes.

Systematic Review vs. Individual Code Modifications

- Individual code modifications, as opposed to the systematic review of an entire set of codes, are appropriate when the majority of values are correct. They require several reference services that are correctly valued relative to each other and to the majority of the remaining codes. However, they can create new misalignments if the modification is performed relative to reference codes that are incorrectly aligned or relative to the unchanged codes. It is also difficult to appraise multiple codes correctly when misalignment exists along reference services.

- The systematic review of an entire family of codes is necessary when multiple problems exist. When the process is well carried out, it assures the correct alignment of all codes in question, and can be accomplished in a budget neutral fashion if the specialty family can be defined and its allocation of dollars is correct. However, the process is relatively expensive and time consuming.

Measurement of Total Surgical Work

- The extrapolation from pre- and post-operative time to pre and post surgical work values requires an assumption about the intensity of each pre and post operative period. Assumption of constant intensity across all procedures does not appear to be valid. This process may tend to underestimate pre and post surgical work of complex operations while overestimating that of simpler procedures. The collection of large phone/mail survey and time data is necessary to allow for a more correct extrapolation process.

- When considering only total work, surgeons tend to focus on the skin-to-skin period. However, differences in skin-to-skin work are not always well-correlated with differences in total work.

- The measurement of pre and post operative work can be directly related to skin-to-skin work of each procedure or relative to work for the same time period of a benchmark procedure. This permits greater variation in pre and post work value assignments across operations. This cognitive exercise may be better accomplished through a panel discussion than by large sample survey.

Composition of Panels

Most participants viewed the composition of panels as crucial. It was suggested that specialists tend to trivialize other specialists' work and it was felt that the interaction among participants in a multi-specialty panel is beneficial. The multi-specialty panel has the advantage of including the more general perspective, but the non-specialists do need to be familiar with the procedure rated. Some participants thought that the rating panel should also include non-physicians, physicians practicing in the community, and consumers, as the process is now as much about credibility and public acceptability as it is about correct clinical measurement. In contrast to this view, other panelists believed that a single specialty panel composed of hand-picked specialists who know the definitions of the codes will produce stable results and has the advantage of being simpler to run and less expensive. Each panel can rate fifteen to thirty procedures during a one-day session. However, one problem is that specialties and sub-specialties multiply very fast.

The participants reached a consensus that there should be a two-stage process: first, a single specialty panel ranks and rates procedure codes, and second, the results of the single specialty panel are submitted to a multidisciplinary panel--comprised of at least ten physicians representing all the specialties--which reviews the results. To increase the reliability of the values obtained, it was suggested that overlapping sets of codes be submitted to several panels, or to have two or three panels discuss the same codes.

The participants were aware of the potential for bias in rating due to physicians' self-interest. As a possible solution, they suggested either creating panels composed of salaried physicians, or including several Carrier Medical Directors.

Degree of Variation Within Panels

The participants observed that different group processes for obtaining relative values yield different results. In general, the process is sensitive to the moderator, and by establishing a uniform structure, process and decision rules, HCFA can minimize individual bias. The issue of enforced consensus was raised. Some experts had experience with a group process where consensus was required, and others observed processes where following a group discussion each rater assigned his or her values. When no discussion took place, the values assigned were most inflationary, as in telephone surveys. In the group process, some of the variation observed can be attributed to differences in the interpretation of CPT codes, the difference in treatment between the typical patient and the "Medicare" patient, and the difference between inpatient and outpatient services. This variation can be reduced by using more narrowly defined services. One expert suggested giving more weight to rates produced by the specialty that most frequently performs the service, but this was refuted because of the specialty's bias concerning its own codes' work values. It was also found that the iterations built in the refinement process led to an increase in the convergence of rates.

The Reference Set

The participants stressed that the work values are very sensitive to the values in the reference set. It is therefore very important to identify for each specialty a list of codes that physicians and payers find sound and acceptable. Criteria for including services in the reference set are:

- high frequency
- unambiguous CPT codes
- spanning the breadth of the relative value scale of work
- exhibiting low variation in values assigned by panelists
- acceptance by other specialties.

Several participants suggested that HCFA refine the reference set separately for procedures and for evaluation and management (EM) services because procedures will otherwise tend to be evaluated higher than EM services. Combined with budget neutrality, this will avoid RVUs creep for procedural codes.

Frequency of the Refinement Process

The ideal system for refining work RVUs would be one which is open to revision but does not become open to "creeping." The participants pointed out that all the comments received by HCFA related to procedure codes and not to evaluation and management codes. This produces a danger of scale creeping since, while one cannot claim that change has occurred in the way office visit services are delivered, one can claim that technological changes have occurred in procedural services that require additional time and skills.

Changes in the work values may be necessary in response to specialties' comments, following changes in codes' definitions, and following changes in technology which are not reflected by changes in coding. All the participants stressed the importance of clear CPT definitions and the close relationship between the refinement of the RVUs of physicians' work and changes in the definitions of services. Many of the comments received from specialties related to differences in the interpretation of codes. HCFA recognized the AMA's role in revising CPT codes. Changes in CPTs will have a major impact on costs. It was therefore suggested by some participants that the coding should be frozen until the scale is settled, except for new technologies.

The participants identified two approaches to the process of updating and revising work values; selecting a set of problems which are common to many specialties and trying to solve them, and examining problems associated with specific codes. For example, HCFA may choose to examine certain blocks of codes each year, or could decide to identify new technologies and revise only those work values that changed as a result of changes in technology. The reexamination of problems across specialties has the advantage of being more effective and more equitable.

The first stage of the refinement process must solve intra-specialty inequities in the single specialty panel which will respond to comments submitted using a common format, and a group process which has to be more structured and more standardized than the one currently implemented. The multi-specialty panel can address problems which are common to several specialties, ensure equity among specialties, and avoid RVU creep.

The participants stressed the need for developing indices for tracking new technologies, and the need for reevaluation of new technologies every three years. A major concern expressed by the ACP representative was that all the comments submitted to HCFA by the specialty and sub-specialty societies concerned only procedural CPT codes while the EM codes were not considered. Specialists tended to attribute values two or three times higher to their procedures than to their EM services. It was felt that it is more difficult to make a case for raising the values of EM services than it is for increasing a procedure's value because the description of the service is more diffuse than that of the procedure. In order to avoid across the board increases for procedures at the expense of EM, it was suggested that separate budgets be set for procedures and for EM services and that they be rated separately, using different reference sets.

Development of a Research Agenda

Several broad areas were identified during the meeting as requiring further research. The participants agreed that high priority should be given to issues which cut across most specialties; their resolution would increase the efficiency of the refinement process. The following is an outline of issues for a research agenda:

- Development of a uniform structure, as well as uniform instructions and decision rules to be followed in the refinement process of physicians' relative work values. In the process of developing these, several across-specialty problems raised by the experts will be addressed: composition of panels (by specialty, experience, practice style geographical dispersion, participation of non-physicians), preparation of participants, definition of codes, clear instructions for conducting the group process, uniform answers to questions frequently asked by participants, and evaluation of the input from participants.

- Development of a valid reference set that will be accepted by all the specialty societies. Several criteria for values to be included in a reference set were mentioned at the meeting. The work values for the reference set will be estimated from empirical data, by experts, and in a group process. A survey of salaried physicians to measure physicians' work could also be conducted.

- The identification of information needed to refine and update the work values, and development of a database which will collect it. Such information can be used for assigning work values to new codes and for tracking the utilization of new technologies.

- Refinement of evaluation and management codes. Considering different definitions of work components for EM and for procedure codes would produce higher values for the EM codes. The establishment of two separate processes for refinement should be explored.

- Development of guidelines for a periodic review of code values, and a system to make interim work estimates for newly evolving procedures.

- Separate measurement of the different work components for determining payment in cases in which a different physician or a surgical assistant delivers the post-operative care. The service period should be measured and different periods should be established for different services.

- Development of RBRVS for services provided by non-physicians.

- Adjustment of the relative values of physicians' work by the relative value of the service to the patient. This assumes the feasibility of developing a relative value scale of the effectiveness of physicians' services.

- Development of a more objective measure for intensity in magnitude estimation for determining physician work in both procedures and EM services.

- Correction of the compression of the scale: Bias seems to exist in the resource-based approach which overvalues the least complex procedures and undervalues the most difficult procedures.

- The impact of the fee schedule on:

  a) Access to care for the Medicare population

  b) Physician practice style

  c) Physician referral patterns

- Examination of differences across providers in code bundling and reporting.

LIST OF PARTICIPANTS

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July 15, 1992

PANELISTS

Peter Braun, MD
Co-Principal Investigator
Harvard University
School of Public Health
Holyoke Center, 7th fl. Rm. 725,
1350 Massachusetts Ave.
Cambridge, MA 02138
(617) 496-8820

Henry Desmarais, MD
Principal
Health Policy Alternatives
122 C Street, NW
Suite 820
Washington DC, 20001
(202) 737-3390

Allen Dobson, Ph.D.
Vice President
Lewin, ICF
9300 Lee Highway
Suite 400
Fairfax, VA 22031
(703) 218-5500

Art Donovan, MD
1201 Heatherside
Pasadena, CA 99105

Dan Dunn, Ph.D.
Research Economist
Harvard University
School of Public Health
Holyoke Center
7th Floor, Room 715
1350 Massachusetts Ave.
Cambridge, MA 02138
(617) 496-8820

Paul Ebert, MD
Director
American College of Surgeons
55 E. Erie Street
Chicago, Ill. 60611
(312) 664-4050

Norman Hertzer, MD
Cleveland Clinic
Chairman
Department of Vascular Surgery (S-61)
9500 Euclid Avenue
Cleveland, OH 44195
(216) 444-5705

James Kahan, Ph.D.
Senior Behavioral Scientist
Rand Corporation
1700 Main Street
Santa Monica, CA 90407
(310) 393-0411

Paul Lee, MD
Rand Corporation
1700 Main Street
Santa Monica, CA 90407
(310) 393-0411 ext. 6355

Lauren LeRoy, Ph.D.
Physician Payment Review Commission
Deputy Director
2120 L Street, NW
Suite 510
Washington DC, 20037
(202) 653-7220

Monica Noether, Ph.D.
Vice President
Abt Associates Inc.
55 Wheeler Street
Cambridge, MA 02138
(617) 492-7100

Mark Segal, Ph.D.
Director
Department of Health Care Financing
American Medical Association
515 N. State Street
Chicago, Ill. 60610
(312) 464-4352

Howard Shapiro, Ph.D.
Director of Public Policy
American College of Physicians
700 13th Street, NW
Suite 250
Washington, DC 20005
(202) 393-1650

Anthony So, MD
Medical Research Associate
Health and Public Policy
American College of Physicians
6th Street and Race
Philadelphia, PA 19106
(215) 351-2400

HCFA

Mike Borowitz, MD
HCFA
Office of Research
6325 Security Blvd., 2-B-14
Baltimore, MD 21207
(410) 966-6631

Kathleen Buto
HCFA
Office of Research
6325 Security Blvd., 2-B-14
Baltimore, MD 21207
(410) 966-5674

Jesse Levy, Ph.D.
HCFA
Office of Research
6325 Security Blvd.
Baltimore, MD 21207

Bart McCann, MD
HCFA
Office of Research
6325 Security Blvd.
Baltimore, MD 21207

Marc Stone, MD
HCFA
Office of Research
6325 Security Blvd.
Baltimore, MD 21207

LEONARD DAVIS INSTITUTE

J. Sanford Schwartz, MD
Leonard Davis Institute
University of Pennsylvania
3641 Locust Walk
Philadelphia, PA 19104
(215) 898-5611

Orit Even-Shoshan, MA
Leonard Davis Institute
University of Pennsylvania
3641 Locust Walk
Philadelphia, PA 19104
(215) 898-2583

Laurence E. Earley, MD
University of Pennsylvania
International Medical Programs
School of Medicine
Stemmler Hall, Suite 100
Philadelphia, PA 19104/6087
(215) 573-3419

Keith Aaronson, MD
Hospital of the University of Pennsylvania
Cardiovascular Section
3400 Spruce Street
9 Founders Building
Philadelphia, PA 19104
(215) 227-2182

Lily Moumtaz, MS.Ed.
Leonard Davis Institute
University of Pennsylvania
3641 Locust Walk
Philadelphia, PA 19104
(215) 898-4220

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Cardiology Panel

May 13, 1992

Background

On May 13, the Leonard Davis Institute convened a small group of cardiologists to rank and rate a set of 42 cardiology procedures. The object of this pilot study was not to establish new values for the selected procedures but to examine the method(s) through which the panel arrives at these values, the factors that influence this type of group decision-making and the appropriateness of refining the Resource Based Relative Value Scale through a small group process. Subsequently, recommendations could be made to the Health Care Financing Administration concerning various methods for refining the Relative Value Scale of Physicians' Work.

National representation through geographic distribution was not one of the study's objectives. All of the participants, except a Medical Director from New York and a cardiologist from Massachusetts, were based in Philadelphia. However, the research team attempted to recruit a mix of specialists and non-specialists practicing in a variety of settings (e.g. academic medical centers, hospitals, community practice and private practice) and who have had previous exposure to and experience with the procedures that were selected for this study. Participants were 5 cardiologists in academic practice, one medical director, one general practitioner and one cardiologist in private practice. A list of participants is enclosed.

Peter Kuriloff, Ed.D., a specialist in group processes observed the process and later provided his comments on the structure, process and organization of the meeting. Also attending as observer was Michael Borowitz, MD, the Health Care Financing Administration project officer of this project. The discussion was moderated by J. Sanford Schwartz, MD.

Organization

Prior to the meeting, participants received a set of 42 cardiology procedures selected by a cardiologist on the research team. These procedures were selected from a list of procedures whose values were contested by the American College of Cardiology on the basis of being frequently performed. They consisted of 11 pacemaker, 11 electrophysiology, 14 cardiac catheterization and 6 echocardiography procedures. Participants also received a full description of the selected procedures as they appear in the Current Procedural Terminology manual of 1992, and a reference set of 125 procedures to be used as a basis for comparison. The reference procedures were listed both in ascending and descending order of work values. In order to simplify the ranking and rating process, decimal points were eliminated from the reference list by multiplying values by ten. The reference procedures span the spectrum of relative work values, are comprised of frequently performed services and were not contested by specialty societies. Participants ranked and rated the set of procedures and returned them before the meeting. Subsequently, and before coming to the meeting, they received the work values and clinical justifications submitted to HCFA by the American College of Cardiology for the same procedures, as well as the original values determined by the Hsiao team and the fee schedule adopted by HCFA. In both cases, the service period for each procedure was provided. They reranked and rerated them after having reviewed the comments of the ACC and brought them to the meeting for discussion. Copies of the worksheets are enclosed. The research team sought to estimate the extent to which participants would change the values they assigned before the meeting 1) once they review the comments of the specialty societies and 2) as a result of the cardiology panel discussion.

Process

The meeting began with an introduction by Dr. Schwartz summarizing information on the development, refinement and current status of the Resource Based Relative Value Scale of Physicians' Services. The discussion began with a definition of the components of work. Work was defined in terms of the following components:

1. Time
2. Mental Effort and Judgement
3. Technical Skills and Physical Effort
4. Stress

Service components consisted of pre-service, post-service and intra-service periods. Pre-service period starts 24 hours prior to the actual performance of a procedure, post-service period is 90 days after the performance of most surgical procedures and intra-service period is the actual encounter between the physician and the patient. Participants were asked to provide a total value that takes into consideration pre, post and intra-service periods. The relation between various work components was discussed. It was noted that work components are interdependent, for instance, time and/or stress may be affected by technical skills. Moreover, the panel found it difficult to arrive at an objective and valid estimate of the level of stress and mental effort involved in various procedures. In order to rank and rate procedures, participants found it useful to first rank the procedures in terms of their work value, then anchor the first and last procedure by comparing their values to those of procedures on the reference set, and last rate the procedures between these two anchors. It was observed that participants had relatively less difficulty ranking the procedures than rating them. They found it more difficult to decide which procedures on the reference set to use and even more difficult to decide on the distance on the scale.

While ranking and rating procedures during the meeting, participants took into consideration the median value of the responses prior to the meeting as well as the values provided by the specialty society. The discussion mainly focused on clarifying the components of every procedure in terms of physical and mental effort, technical skills, time and stress in order to appropriately rank order procedures and rate them by comparing them with reference procedures of the same family. Through this discussion, participants arrived at new values for every procedure. These values were influenced by the specialty society comments, values assigned by other participants prior to the meeting (provided as median values during the meeting) and the discussion that took place during the meeting. One of the problems encountered by panelists while rating procedures is the lack of clarity of some of the CPT definitions. Some of these definitions were not specific enough to allow for a judgement of the amount of work involved in the procedure. In some instances, services needed to be either aggregated or updated to reflect the actual performance of a procedure. Deference to authority was also observed whenever the procedure in question fell outside the specialty of the individual participants. Those specialists who performed a specific procedure frequently felt more qualified to evaluate the complexity and time involved in that procedure.

Results

As predicted, the specialty society's comments influenced in many instances the ratings of procedures by participants. Reviewing the comments seems to have led to an increase in the values assigned to echocardiography (42.8%), electrophysiology (42%) and pacemaker procedures (44.8%). On the other hand, values assigned to cardiac catheterization procedures decreased (35%) after comments were reviewed by participants. Values assigned to cardiac catheterization, echocardiography and electrophysiology procedures appear to have increased by 42%, 66% and 35% respectively subsequent to the discussion that took place during the meeting. As a whole, the number of values that were unchanged is less (31.7%) than that of values that were changed in either direction (64.8%). There was a significant decrease in variation among participants; information from both the specialty society's clinical justifications and the group discussion seem to have increased consensus among participants as revealed by a decrease in variation of work values among participating physicians.

Discussion of the process

Dr. Kuriloff provided some comments concerning the process and structure of the meeting. He pointed out the importance of establishing at the onset a common understanding of the objectives of the meeting and the basic concepts of the Relative Value Scale. Moreover, he emphasized that LDI and the HCFA representative should attempt to facilitate the discussion and solicit the participants' opinions as opposed to providing answers to their questions. It was also suggested that the process of ranking and rating could be made easier if participants could start with an "easy" procedure, evaluate the amount of work, stress, skills, and risk involved in it and then apply the same criteria on the more difficult procedures. The issue of composition of the panel was also raised. It was obvious that many participants deferred to specialists on the panel for clarifications of certain procedures and expected them to make the final decision on procedures in their field. Consequently, work values for each subspecialty were largely determined by specialists on the panel. In order to avoid this, it was suggested that panels should include knowledgeable generalists who would balance the authority of the specialists.

List of Participants

Keith Aaronson, MD
Postdoctoral Fellow
Cardiovascular Section
Hospital of the University of Pennsylvania

Paul Deutsch, MD
Medical Director
Medicare Part B
NYU Medical Center

Michael Hanna, MD
Research Associate
Cardiovascular Section
Hospital of the University of Pennsylvania

David Goldmann, MD
Associate Professor
Medical School
University of Pennsylvania

Bill G. Kussmaul, MD
Assistant Professor
Medical School
Cardiovascular Section
University of Pennsylvania

Joel Morganroth, MD
Graduate Hospital
Philadelphia, Pennsylvania

David Schwartz, MD
The Medical Group
Beverly, Massachusetts

Laurence E. Earley, MD
International Medical Programs
Medical School
University of Pennsylvania

TOTAL WORK ESTIMATES
CARDIAC CATHETERIZATION PROCEDURES

CPT Code	Brief Descriptor	Global Fee Per.*	Your Rank	Your Value	Reference Code	Reference Code
93501	Right heart catheterization	0				
93503	Insert and place flow directed catheter	0				
93526	Combined R heart cath & retro L heart cath	0				
93536	Percutaneous insertion of intra-aortic balloon	0				
93543	A) Injection procedure during cardiac cath. B) Supervision, interpretation and report	0 X				
93546	A) Combined L. heart cath & L. vent. angiog. B) Supervision, interpretation and report	0 X				
93547	A) Combined L. H. cath, selective cor. angiog., one or more cor. art. & sel. L. vent. angiog. B) Supervision, interpretation and report	0 X				
93548	A) 93547 with aortic root aortography B) Supervision, interpretation and report	0 X				
93549	A) 93547 combined with R. H. cath B) Supervision, interpretation and report	0 X				
93550	A) 93549 with sel. visual. of bypass graft B) Supervision, interpretation and report	0 X				
93552	A) Combined L. H. cath, sel. cor. ang., 1 or more cor. art., with sel. L. V. cineang. and visual. of bypass graft B) Supervision, interpretation and report	0 X				
92975	Thrombolysis, coronary; by intracoronary infusion, with sel. cor. angiography	0				
92982	Percut. transluminal cor. angioplasty; 1 vessel	0				
92984	92982 with each additional vessel	0				

Please refer to the attached full description of procedures.

*Global Fee Period: Services performed within this period, in connection with the procedure, cannot be billed separately. X=Concept does not apply

TOTAL WORK ESTIMATES
ECHOCARDIOGRAPHY PROCEDURES

CPT Code	Brief Descriptor	Global Fee Per.*	Your Rank	Your Value	Reference Code	Reference Code
93307	Echocardiography, real-time with image doc. (2D); with or without M-mode rec.; complete	X				
93308	Echocardiography, real-time with image doc. (2D); with or without M-mode rec.; follow-up or limited study	X				
93312	Echocardiography, real-time with image doc. (2) (with or without M-mode rec.), transesophageal	X				
93320	Doppler echocardiography; complete	X				
93321	Doppler echocardiography; follow-up or limited study	X				
93350	Echocardiography, real-time with image doc. (2), during rest and CV stress, using max or submax treadmill including ECG monitoring, with interpretation and report	X				

Please refer to the attached full description of procedures.

*Global Fee Period: Services performed within this period, in connection with the procedure, cannot be billed separately. X=Concept does not apply

TOTAL WORK ESTIMATES
ELECTROPHYSIOLOGICAL PROCEDURES

CPT Code	Brief Descriptor	Global Fee Per.*	Your Rank	Your Value	Reference Code	Reference Code
93600	Bundle of HIS recording	0				
93602	Intra-atrial recording	0				
93603	Right ventricular recording	0				
93609	Intraventricular and/or intra-atrial mapping of tachycardia site(s) with cath manip. to identify origin	0				
93610	Intra-atrial pacing	0				
93612	Intraventricular pacing	0				
93615	Esophageal recording of atrial electrogram with or without ventricular electrogram(s)	0				
93618	Induction of arrhythmia by electrical pacing	0				
936[illegible]9	Comprehensive electrophysiologic eval. with right atrial & vent. pacing & rec. HIS bundle rec. and induction of arrhythmia	0				
93650	Intracardiac catheter ablation of arrhythmogenic focus or tract(s)	0				
93660	ANS eval. of CV function with tilt table eval.	0				

Please refer to the attached full description of procedures.

*Global Fee Period: Services performed within this period, in connection with the procedure, cannot be billed separately. X=Concept does not apply

TOTAL WORK ESTIMATES WORKSHEET
PACEMAKER PROCEDURES

CPT Code	Brief Descriptor	Global Fee Per.*	Your Rank	Your Value	Reference Code	Reference Code
33200	Insert. of perm. pacemaker with epicard. electrode; by thoracotomy	90				
33207	Insert. of perm. pacemaker with transvenous electrode(s); ventricular	90				
33208	Insert. of perm. pacemaker with transvenous electrode(s); AV sequential	90				
33212	Insert or replace pacemaker pulse generator or cardioverter-defibrillator pulse generator	90				
33245	Insert, replace or reposition perm. pacemaker transvenous electrode(s) only	90				
33232	Removal of permanent pacemaker	90				
33245	Implantation of cardioverter-defib. pads with or without sensing electrodes	90				
33245	Implantation of cardioverter-defib. pads; with insertion of auto cardioverter-defib pulse generator	90				
33248	Revision or removal of auto implantable cardioverter-defib. pads & electrodes	90				
93732	Electronic analysis of dual-chamber internal pacemaker system; with reprogramming	X				
93733	Electronic analysis of dual-chamber internal pacemaker system; telephonic	X				

Please refer to the attached full description of procedures.

*Global Fee Period: Services performed within this period, in connection with the procedure, cannot be billed separately. X=Concept does not apply

TOTAL WORK ESTIMATES
CARDIAC CATHETERIZATION PROCEDURES

CPT Code	Brief Descriptor	Global Fee Period	FR Work RVUs	Hsiao Phase III Work RVUs	Spec. Soc. Work RVUs	Your Rank	Your Value
93501	Right heart catheterization	0	32	33	42		
93503	Insert and place flow directed catheter	0	26	30	32		
93526	Combined R heart cath & retro L heart cath	0	62	56	62		
93536	Percutaneous insertion of intra-aortic balloon	0	57	55	51		
93543	A) Injection procedure during cardiac cath. B) Supervision, interpretation and report (75523)	0 X	2 9	13 •	5 5		
93546	A) Combined L. heart cath & L. vent. angiog. B) Supervision, interpretation and report (75523)	0 X	47 9	51 •	49 10		
93547	A) Combined L. H. cath, selective cor. angiog., one or more cor. art. & sel. L. vent. angiog. B) Supervision, interpretation and report (75754)	0 X	49 14	60 •	65 20		
93548	A) 93547 with aortic root aortography B) Supervision, interpretation and report (75754+75762)	0 X	52 26	67 •	70 22		
93549	A) 93547 combined with R. H. cath B) Supervision, interpretation and report (75754)	0 X	67 14	68 •	80 20		
93550	A) 93549 with sel. visual. of bypass graft B) Supervision, interpretation and report (75754+75766)	0 X	69 28	80 •	95 24		
93552	A) Combined L. H. cath, sel. cor. ang., 1 or more cor. art., with sel. L. V. cineang. and visual. of bypass graft B) Supervision, interpretation and report (75754+75766)	0 X	52 28	74 •	80 24		
92975	Thrombolysis, coronary; by intracoronary infusion, with sel. cor. angiography	0	76	78	70		
92982	Percut. transluminal cor. angioplasty; 1 vessel	0	102	87	150		
92984	92982 with each additional vessel	0	19	21	40		

Please refer to the attached full description of procedures.

TOTAL WORK ESTIMATES
ECHOCARDIOGRAPHY PROCEDURES

CPT Code	Brief Descriptor	Global Fee Period	FR Work RVUs	Hsiao Phase III Work RVUs	Spec. Soc. Work RVUs	Your Rank	Your Value
93307	Echocardiography, real-time with image doc. (2D); with or without M-mode rec.; complete	X	4	•	17		
93308	Echocardiography, real-time with image doc. (2D); with or without M-mode rec.; follow-up or limited study	X	2	•	12		
93312	Echocardiography, real-time with image doc. (2) (with or without M-mode rec.), transesophageal	X	5	33	25		
93320	Doppler echocardiography; complete	X	4	11	6		
93321	Doppler echocardiography; follow-up or limited study	X	2	8	4		
93350	Echocardiography, real-time with image doc. (2), during rest and CV stress, using max or submax treadmill including ECG monitoring, with interpretation and report	X	12	22	25		

Please refer to the attached full description of procedures.

TOTAL WORK ESTIMATES
PACEMAKER PROCEDURES

CPT Code	Brief Descriptor	Global Fee Period	FR Work RVUs	Hsiao Phase III Work RVUs	Spec. Soc. Work RVUs	Your Rank	Your Value
33200	Insert. of perm. pacemaker with epicard. electrode; by thoracotomy	90	104	108	130		
33207	Insert. of perm. pacemaker with transvenous electrode(s); ventricular	90	77	77	90		
33208	Insert. of perm. pacemaker with transvenous electrode(s); AV sequential	90	78	81	110		
33212	Insert or replace pacemaker pulse generator or cardioverter-defibrillator pulse generator	90	63	65	45		
33216	Insert, replace or reposition perm. pacemaker transvenous electrode(s) only	90	56	58	110		
33232	Removal of permanent pacemaker	90	52	57	80		
33245	Implantation of cardioverter-defib. pads with or without sensing electrodes	90	163	168	133		
33246	Implantation of cardioverter-defib. pads; with insertion of auto cardioverter-defib pulse generator	90	203	129	245		
33248	Revision or removal of auto implantable cardioverter-defib. pads & electrodes	90	173	107	275		
93732	Electronic analysis of dual-chamber internal pacemaker system; with reprogramming	X	7	13	9		
93733	Electronic analysis of dual-chamber internal pacemaker system; telephonic	X	5	5	2		

Please refer to the attached full description of procedures.

TOTAL WORK ESTIMATES
ELECTROPHYSIOLOGICAL PROCEDURES

CPT Code	Brief Descriptor	Global Fee Period	FR Work RVUs	Hsiao Phase III Work RVUs	Spec. Soc. Work RVUs	Your Rank	Your Value
93600	Bundle of HIS recording	0	22	23	37		
93602	Intra-atrial recording	0	22	15	30		
93603	Right ventricular recording	0	22	16	30		
93609	Intraventricular and/or intra-atrial mapping of tachycardia site(s) with cath manip. to identify origin	0	106	76	165		
93610	Intra-atrial pacing	0	32	21	35		
93612	Intraventricular pacing	0	32	22	35		
93615	Esophageal recording of atrial electrogram with or without ventricular electrogram(s)	0	10	14	20		
93618	Induction of arrhythmia by electrical pacing	0	32	40	60		
93620	Comprehensive electrophysiologic eval. with right atrial & vent. pacing & rec. HIS bundle rec. and induction of arrhythmia	0	122	73	120		
93650	Intracardiac catheter ablation of arrhythmogenic focus or tract(s)	0	80	140	220		
93660	ANS eval. of CV function with tilt table eval.	0	11	•	20		

Please refer to the attached full description of procedures.

AFTER DISCUSSION TOTAL WORK ESTIMATES
PACEMAKER PROCEDURES

CPT Code	Brief Description	Med. RVUs Blue Form	Coeff of Var. Blue Form	RVUs Yel. Form	After Disc. RVUs
33200	Insert. of perm. pacemaker with epicard. electrode; by thoracotomy				
33207	Insert. of perm. pacemaker with transvenous electrode(s); ventricular				
33208	Insert. of perm. pacemaker with transvenous electrode(s); AV sequential				
33212	Insert or replace pacemaker pulse generator or cardioverter-defibrillator pulse generator				
33216	Insert, replace or reposition perm. pacemaker transvenous electrode(s) only				
33232	Removal of permanent pacemaker				
33245	Implantation of cardioverter-defib. pads with or without sensing electrodes				
33246	Implantation of cardioverter-defib. pads; with insertion of auto cardioverter-defib pulse generator				
33248	Revision or removal of auto implantable cardioverter-defib. pads & electrodes				
93732	Electronic analysis of dual-chamber internal pacemaker system; with reprogramming				
93733	Electronic analysis of dual-chamber internal pacemaker system; telephonic				

AFTER DISCUSSION TOTAL WORK ESTIMATES
ECHOCARDIOGRAPHY PROCEDURES

CPT Code	Brief Description	Med. RVUs Blue Form	Coeff of Var. Blue Form	RVUs Yel. Form	After Disc. RVUs
93307	Echocardiography, real-time with image doc. (2D); with or without M-mode rec.; complete				
93308	Echocardiography, real-time with image doc. (2D); with or without M-mode rec.; follow-up or limited study				
93312	Echocardiography, real-time with image doc. (2) (with or without M-mode rec.), transesophageal				
93320	Doppler echocardiography; complete				
93321	Doppler echocardiography; follow-up or limited study				
93350	Echocardiography, real-time with image doc. (2), during rest and CV stress, using max or submax treadmill including ECG monitoring, with interpretation and report				

AFTER DISCUSSION TOTAL WORK ESTIMATES
CARDIAC CATHETERIZATION PROCEDURES

CPT Code	Brief Description	Med. RVUs Blue Form	Coeff of Var. Blue Form	RVUs Yel. Form	After Disc. RVUs
93501	Right heart catheterization				
93503	Insert and place flow directed catheter				
93526	Combined R heart cath & retro L heart cath				
93536	Percutaneous insertion of intra-aortic balloon				
93543	A) Injection procedure during cardiac cath. B) Supervision, interpretation and report				
93546	A) Combined L. heart cath & L. vent. angiog. B) Supervision, interpretation and report				
93547	A) Combined L. H. cath, selective cor. angiog., one or more cor. art. & sel. L. vent. angiog. B) Supervision, interpretation and report				
93548	A) 93547 with aortic root aortography B) Supervision, interpretation and report				
93549	A) 93547 combined with R. H. cath B) Supervision, interpretation and report				
93550	A) 93549 with sel. visual. of bypass graft B) Supervision, interpretation and report				
93552	A) Combined L. H. cath, sel. cor. ang., 1 or more cor. art., with sel. L. V. cineang. and visual. of bypass graft B) Supervision, interpretation and report				
92975	Thrombolysis, coronary; by intracoronary infusion, with sel. cor. angiography				
92982	Percut. transluminal cor. angioplasty; 1 vessel				
92984	92982 with each additional vessel				

AFTER DISCUSSION TOTAL WORK ESTIMATES
ELECTROPHYSIOLOGICAL PROCEDURES

CPT Code	Brief Description	Med. RVUs Blue Form	Coeff of Var. Blue Form	RVUs Yel. Form	After Disc. RVUs
93600	Bundle of HIS recording				
93602	Intra-atrial recording				
93603	Right ventricular recording				
93609	Intraventricular and/or intra-atrial mapping of tachycardia site(s) with cath manip. to identify origin				
93610	Intra-atrial pacing				
93612	Intraventricular pacing				
93615	Esophageal recording of atrial electrogram with or without ventricular electrogram(s)				
93618	Induction of arrhythmia by electrical pacing				
93620	Comprehensive electrophysiologic eval. with right atrial & vent. pacing & rec. HIS bundle rec. and induction of arrhythmia				
93650	Intracardiac catheter ablation of arrhythmogenic focus or tract(s)				
93660	ANS eval. of CV function with tilt table eval.				

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